Discussion Document: Asbestos in Soil

1. Background

Asbestos is an environmental contaminant frequently encountered at previously developed "brownfields" sites. It is highly hazardous to human health where people can inhale it. Where there is no route of exposure (e.g., where it is buried at depth in soil or under another type of barrier), it presents low direct risks to public health, although care needs to be taken to ensure that the asbestos will not be brought to the surface by disturbing its cover or by excavation.

Asbestos in the environment most commonly results from two types of human actions: 1) renovation or demolition of buildings that contained asbestos without the benefit of modern removal and management techniques; and 2) disposal of asbestos-containing material at the site, either before today's rules were promulgated or as the result of illegal disposal. Fires at buildings that contained asbestos can release significant quantities of this material into the environment. There are also residues from former commercial asbestos mining operations in several western Massachusetts towns (Chester, Blandford, Plainfield, and Hinsdale). These mines were located at the southern edge of a geologic formation known as the "Talc-Serpentine District", in which naturally occurring asbestos extends from western Massachusetts into Vermont. Naturally occurring low levels of asbestos are also found occasionally in other parts of the Commonwealth (e.g., road cuts for I-195 in southeastern Massachusetts). While asbestos is found frequently, it is not as ubiquitous as some other contaminants like PAHs, lead, and mercury which are widely dispersed through air and found throughout urban areas.

Asbestos is regulated by several federal and state programs.

1. Building renovations and demolitions involving asbestos are regulated by the U.S. EPA under NESHAPs, and by the Department under 310 CMR 7.00. The federal program has been delegated to DEP.
2. Asbestos removal work must be performed by contractors holding an appropriate license from the MA Dept. of Labor and Workforce Development (Division of Occupational Safety, DOS).
3. Anyone engaging in renovation or demolition work is required to survey the building for asbestos, and notify MADEP Bureau of Waste Prevention ("BWP") at least 10 days before work commences if asbestos is present. BWP regional staff review plans and conduct inspections to ensure that the renovation or demolition work will not create a condition of air pollution. The notifications, which are submitted by asbestos contractors (and can soon be submitted on-line), satisfy notification requirements of DEP, DOS, and US EPA.
4. Wastes containing asbestos are regulated by BWP under the solid waste rules, 310 CMR 19.00. In general, waste containing any amount of asbestos must be disposed of as a "special waste". It must be shipped to a disposal facility with an approval to accept it, and it must be accompanied by a specific shipping document.
5. Asbestos is a listed "hazardous material" under the Massachusetts Contingency Plan (310 CMR 40.1600). A Reportable Quantity of 1 pound has been established. There are currently no Reportable Concentrations in Soil or Groundwater for asbestos.

2. Waste Site Cleanup Notification Issues

Reminder: The notification requirements described in the Massachusetts Contingency Plan are intended to bring in to the MCP assessment and cleanup process those sites that are likely to pose a significant risk of harm to health, safety public welfare or the environment. However, notification does not mean that a site does pose a significant risk. Conversely, a site that does pose a significant risk may not, today, trigger notification. In summary, notification is a broad, but imperfect, net.

At many sites, particularly construction sites, asbestos is found to have already been released to the environment. In 1987, the Massachusetts Contingency Plan established a "reportable quantity" for asbestos of one pound released in a 24-hour period. However, the RQ has limited applicability and does not apply to sites where the only information available is a site history indicating that asbestos may have been present there in the past and/or analytical data indicating a concentration of asbestos fibers in soil. The absence of clear notification triggers, other than the RQ, has resulted in inconsistent approaches to addressing the discovering of asbestos contamination in soil.

Question for Discussion: What MCP asbestos-in-soil notification triggers should be established, considering the type/form of asbestos, concentration and location/depth?

Type or Form of Asbestos

There are three variables concerning the type/form of asbestos that would need to be addressed for notification purposes:

a. the specific chemical form of asbestos (e.g., chrysotile, crocidolite, amosite, etc.)
b. the friability of the asbestos ("Friable" vs "Nonfriable"). The requirements should recognize that with exposure to weather over time, nonfriable matrices can deteriorate and become friable (or can decompose so that only unconfined asbestos fibers remain in the environment). In these cases, reporting decisions should be based on the condition of the matrix, not the friability of the material in its original state.
c. the physical form of the asbestos (unconsolidated fibers vs "chunks" or "Debris")

Concentration of Asbestos

Measurement of asbestos in soil is complicated by the variety of analytical methods available. Historically, several programs have used a 1% level to define levels of regulatory interest, based, at least in part, by detection limits. (For the purposes of this discussion, it should be assumed that the results are reported in terms of percent-by-area.).

Location/Depth of Asbestos

The MCP currently has notification criteria based on both location (500 ft of a residential dwelling, school,…) and depth (0-12", 0-any depth). Contamination in "surficial soil" in "sensitive areas" may trigger 2-hour notification pursuant to 310 CMR 40.0321(2). Otherwise, the Reportable Concentrations are based on location only. Note that the MCP requires notification decisions to be made based on current conditions at the site (in terms of potential for exposure). A site may not need to be reported today based on current activities that are taking place there, but if site uses change so that people can be exposed to detected contamination, there may be a reporting obligation in the future.

Table 1 is a matrix summarizing the existing notification requirements. In addition, the matrix lists several combinations of factors described above that may be used to establish additional notification requirements. DEP is soliciting input on the need and speed of notification for these conditions. Also, DEP would consider additional conditions that may warrant notification.

DEP recognizes that establishing additional notification requirements would result in the reporting of more asbestos sites than is currently required by regulation. DEP seeks to establish requirements that are consistent with current MCP notification requirements for other hazardous materials.

3. Cleanup Issues ("How Clean is Clean Enough?")

The MCP incorporates a "risk-based" approach to the assessment and cleanup of sites, often relying upon management controls (Activity and Use Limitations) to limit potential exposure and thus reduce the potential risk posed by a site.

Tables 2 and 3 provide outlines for making a "No Significant Risk" demonstration at sites with residual levels of asbestos in soil.

Question for Discussion: How can the MCP risk-based approach be applied to asbestos-in-soil, considering the route of exposure of concern (inhalation), AULs and Upper Concentration Limits?

Inhalation Exposures

Inhalation is the primary exposure route of concern for asbestos. Surficial activities that have the potential to generate dust and any excavation activity could result in asbestos levels in air that may pose a significant risk. When would it be appropriate to rely on dust generation models to predict future risk? direct air measurements?

Activity and Use Limitations

AULs are used at sites to "lock in" site conditions that can be demonstrated to pose No Significant Risk. AULs also rule out, absent further evaluation, changes in site use that may result in higher risks.

Upper Concentration Limits

UCLs are, by definition, levels that could pose a significant risk in the future. They are upper limits on how much contamination may be "risked away" through models or AULs. For asbestos, UCLs may not be appropriate, as some material with high asbestos concentrations (e.g., steam pipes covered in asbestos insulation) may best be left buried. Are there any limits on "risking away" the threat of asbestos that the Department may want to consider?

Method 1 Standards

Is a Method 1 standard desirable? What if the standard were driven by analytical reporting limits rather than a risk-based concentration? (This occurs if the risk-based concentration is lower than the reporting limit).

4. Analytical Methods for Site Assessment and Risk Characterization

Asbestos in soil is typically analyzed using one of two general approaches: Polarized Light Microscopy (PLM) and Transmission Electron Microscopy (TEM).

- PLM can reliably detect asbestos down to 1% in a soil matrix (although the California Air Resources Board, CARB, requires use of PLM with a 0.25% practical quantitation limit).

- TEM is more sensitive and specific than PLM. The electron microscope can discern asbestos fibers and asbestos types from non-asbestos fibers. When used on soil samples, TEM can be used to estimate the number of fibers per sample, which can be extrapolated to an estimate of the mass of asbestos in the sample.

- TEM identifies a variety of fiber types, and picks up smaller and/or narrower fibers that may not be seen with PLM, due to increased magnification. Levels detected below 1% are typically reported by labs as traces.

Appendix A

Figures and Tables

Figure 1 – Generic Version

MCP Notification, Assessment and Remediation of Asbestos in Soil – Conceptual Process

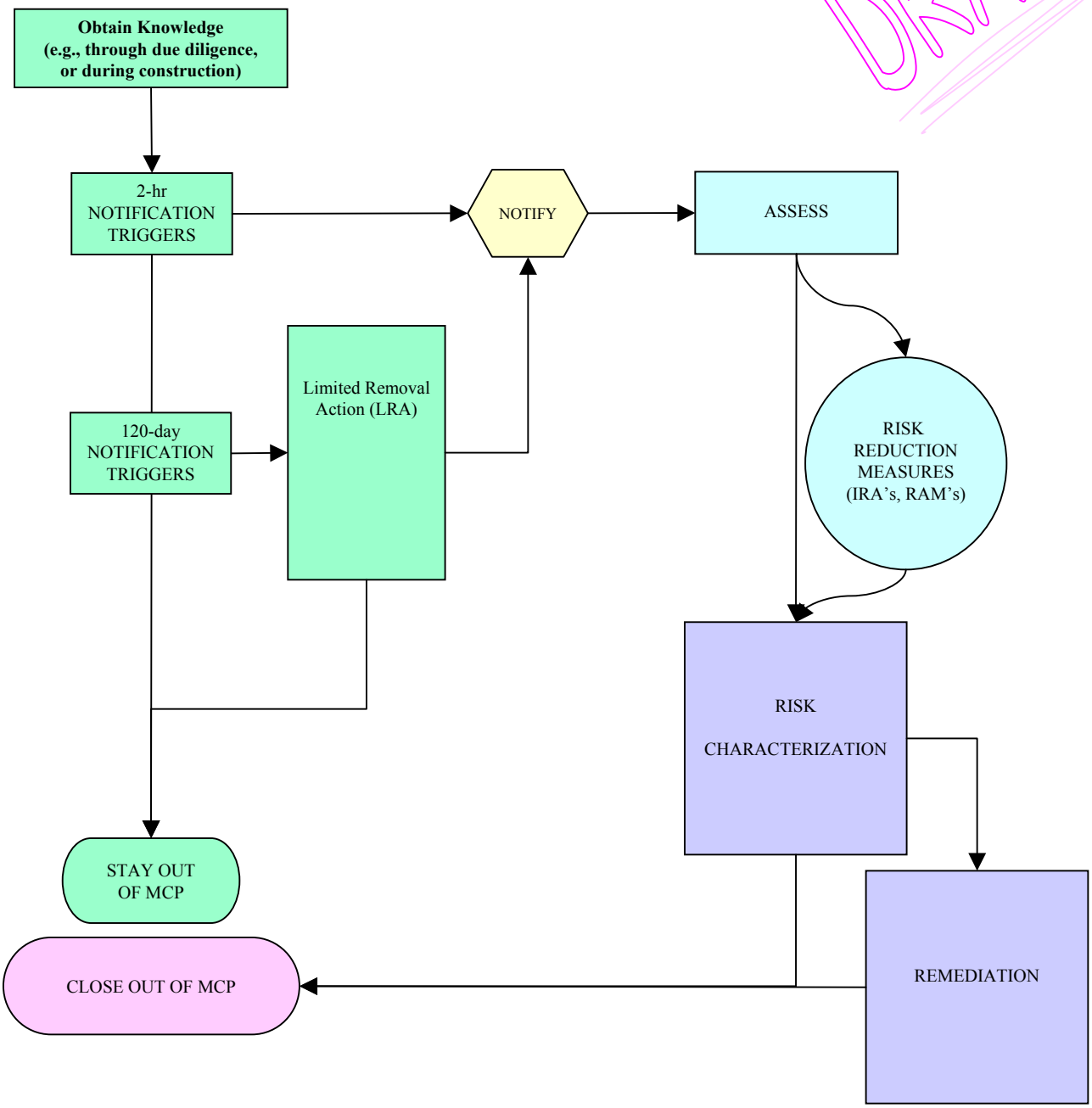

Figure 2

Notification, Assessment and Remediation of Asbestos in Soil – Conceptual Process (Coordinated BWSC/BWP Response)

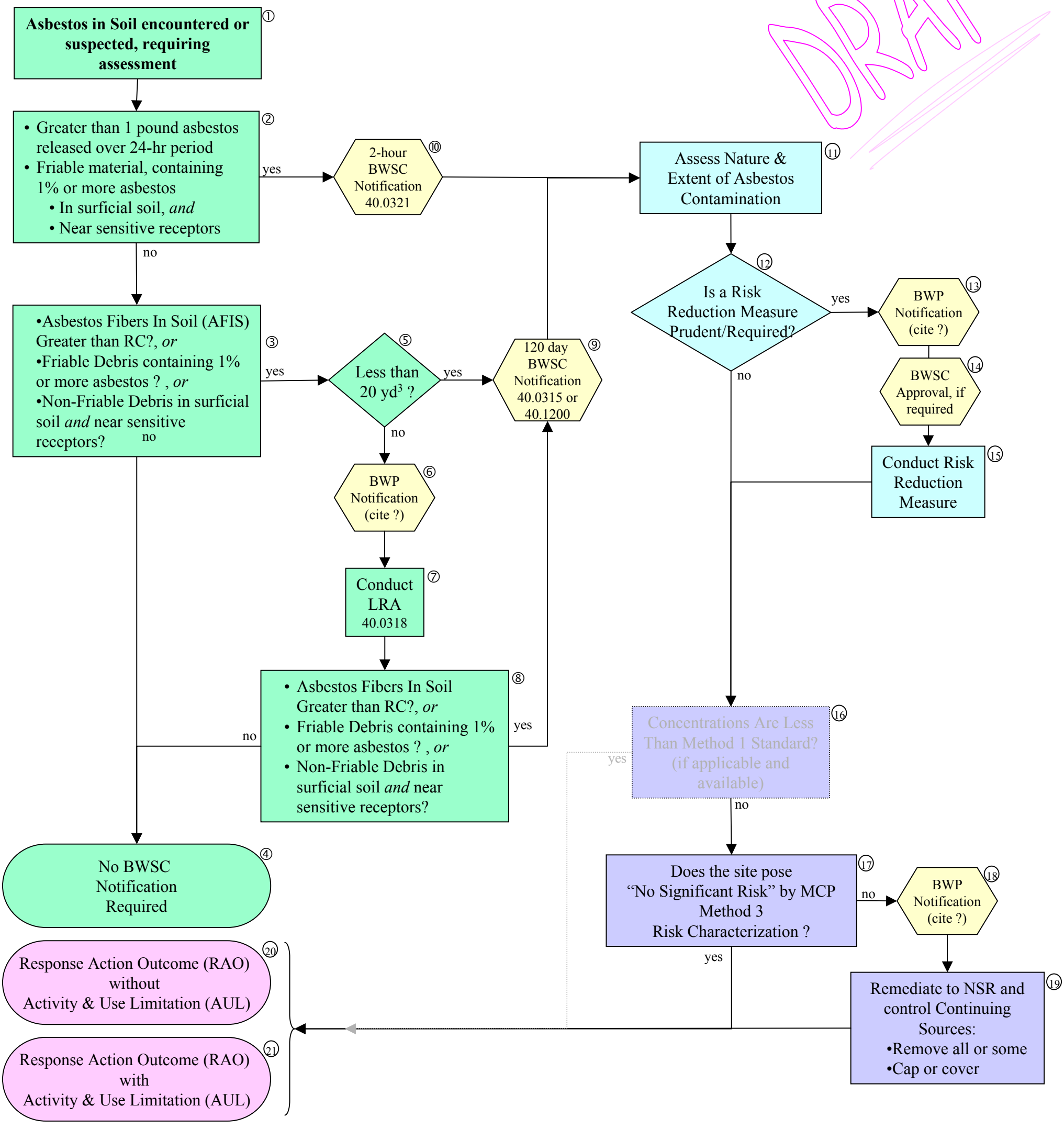

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Table 1 (version 1 - Ordered by Depth to Contamination)
Asbestos-In-Soil Notification Proposal

Discussion Reference Number	Depth	MCP Notification 2hr	MCP Notification 120 day	MCP Notification None	BWP Notification 10-day	BWP Notification None	Asbestos Concentration	Description	Environmental Medium	Additional Conditions	MCP Reference
1.a.	any			X		X	Non-Detect	unconfined fibers	soil		
1.b.	any			X		X	Non-Detect	friable	Debris		
1.c.	any			X		X	Non-Detect	nonfriable	Debris		
2.a.	any	Governed by site-specific conditions, as determined by rules 3-7 below			X		any	unconfined fibers	soil	encountered during excavation in any area	
2.b.	any				X		any	friable	Debris	encountered during excavation in any area	
2.c.	any				X		any	nonfriable	Debris	encountered during excavation in any area	
3.a.	any	X				X[1]	> trace	unconfined fibers	soil	site-specific Imminent Hazard	40.0321(1)(d)
3.b.	any	X				X[1]	> trace	friable	Debris	site-specific Imminent Hazard	40.0321(1)(d)
3.c.	any	X				X[1]	> trace	nonfriable	Debris	site-specific Imminent Hazard	40.0321(1)(d)
4.a.	any	X				X[1]	> 1 lb	unconfined fibers	soil	existing Reportable Quantity (RQ)	40.1600
4.b.	any	X				X[1]	> 1 lb	friable	Debris	existing Reportable Quantity (RQ)	40.1600
4.c.	any	X				X[1]	> 1 lb	nonfriable	Debris	existing Reportable Quantity (RQ)	40.1600
5.a.	0 - 1'	X				X[1]	> 1%	unconfined fibers	soil	in "sensitive areas" consistent with 40.0321	40.0321(2)(c)*
5.b.	0 - 1'		X			X[1]	> 1%	unconfined fibers	soil	in all other areas	40.1600*
5.c.	0 - 1'			X		X[1]	< 1%	unconfined fibers	soil	in all areas	
6.a.	0 - 1'	X				X[1]	> 1%	friable	Debris	in "sensitive areas" consistent with 40.0321	40.0321(2)(c)*
6.b.	0 - 1'		X			X[1]	> 1%	nonfriable	Debris	in "sensitive areas" consistent with 40.0321	40.0315(5)*
6.c.	0 - 1'		X			X[1]	> 1%	friable	Debris	in all other ("nonsensitive") areas	40.0315(5)*
6.d.	0 - 1'			X		X[1]	> 1%	nonfriable	Debris	in all other ("nonsensitive") areas	
6.e.	0 - 1'			X		X[1]	< 1%	friable	Debris	in all areas	
6.f.	0 - 1'			X		X[1]	< 1%	nonfriable	Debris	in all areas	
7.a.	deeper than 1'		X			X[1]	> 1%	unconfined fibers	soil	in all areas	40.1600*
7.b.	deeper than 1'			X		X[1]	< 1%	unconfined fibers	soil	in all areas	
7.c.	deeper than 1'		X			X[1]	> 1%	friable	Debris	in all areas	40.0315(5)*
7.d.	deeper than 1'			X		X[1]	> 1%	nonfriable	Debris	in all areas	
7.e.	deeper than 1'			X		X[1]	< 1%	friable	Debris	in all areas	
7.f.	deeper than 1'			X		X[1]	< 1%	nonfriable	Debris	in all areas	

1. Unless there is management of the contaminated soil ("shovel in ground") such as excavation and disposal.

Debris - MCP defined term, 310 CMR 40.0006, solid material that is a manufactured object, plant or animal matter that is intended for disposal or is no longer serving its intended use, including demolition and construction waste.

Sensitive Area - Defined in 310 CMR 40.0321, any location within 500 feet of a residential dwelling, school, playground, recreation area or park, unless access by children is controlled or prevented by means of bituminous pavement, concrete, or other physical barrier.

* - Proposed regulatory change -- not in current MCP

Paul Locke, DEP BWSC
1/23/03

Table 2

Asbestos-In-Soil: Cleanup Options

Discussion Reference Number	Depth	pathway elimination? (e.g., cap)	Asbestos Concentration	Class A,B RAO Possible?	AUL Required?	Risk Assessment[3] Required?	Additional Comments
1.a	0-1'	no	Non-Detect	yes	no	no	
2.a	0-1'	no	< 1%	yes	maybe[1]	yes	
2.c	0-1'	yes	< 1%	yes	yes[2]	no	
2.d	0-1'	no	> 1%	no	--	--	"Continuing Source" by definition[4]
2.e	0-1'	yes	> 1%	yes	yes[2]	no	
3.a	1 - 3'	no	< 1%	yes	maybe[1]	yes	
3.b	1 - 3'	yes	< 1%	yes	yes[2]	no	
3.c	1 - 3'	no	> 1%	no	--	--	"Continuing Source" by definition[4]
3.d	1 - 3'	yes	> 1%	yes	yes[2]	no	
4.a	deeper than 3'	no	any concentration	yes	maybe[1]	yes	
4.b	deeper than 3'	yes	any concentration	yes	yes[2]	no	

[1] Depends on the basis of the risk assessment. If the assessment assumes unrestricted use (e.g., residential exposure) and shows No Significant Risk, then no AUL is required.

[2] AUL is required to maintain the conditions that have eliminated exposure to the asbestos.

[3] Meaning a quantitative, run-the-numbers, calculate risk, type of risk assessment. The MCP Method 3 "Risk Characterization" would document the pathway elimination ("No Exposure = No Significant Risk")

[4] Draft regulations: 310 CMR 40.1003

Paul Locke, BWSC
3/18/2003

Figure 3
Options for Demonstrating "No Significant Risk" (NSR) for Closure Under the MCP

Parameter	Concentration Units	DEP Dust Model Default	EPA Superfund Tumbler Method	On-Site Pilot Study
AFIS Concentration ("**A**")	% by weight	Measured Concentration in Soil	Representative Composite Sample Analyzed in Tumbler Device	Measured Site Average, as Required
AFIS Released to Air ("**R**")	fibers/g	Assumed 100% of AFIS Concentration	Measured	Back Calculated, as Required
Model	NA	Simplified Dispersion Model may be required to assess "off-site" receptors	Berman	None
Respirable Dust Concentration ("**C**")	$\mu g/cm^3$	Default 61 $\mu g/m^3$	Laboratory Measurement	On-Site Measurement
Ambient Asbestos Concentration	fibers/ cm^3	Calculated **A** X **C**	Modeled { **R** and **C** }	On-Site Ambient Measurement[1]
MCP Compliance Concentration for Demonstration of NSR for Residential Exposure	**0.00004 - 0.0004 fibers/ cm^3 (*risk of* 1 X 10^{-6} – 1 X 10^{-5})**			

1. For example: Average of a minimum of triplicate 8-hour asbestos in air measurements collected at a location within an **enclosed test area** of the disposal site. Conservative test conditions (air velocity, humidity, simulated site activities, etc.). The measured ambient asbestos concentrations and worst-case meteorological conditions would be incorporated into a dispersion model to estimate respirable asbestos exposure point concentrations for a receptor located at the disposal site boundary under current and foreseeable site activities.

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MADEP BWSC PPD

March 18, 2003

Appendix B

Notes to Notification Flowchart (Figure 2)

Notification, Assessment and Remediation of Asbestos in Soil – Conceptual Process (Coordinated BWSC/BWP Response)

Figure 2 provides detail on how the 21E program would apply to asbestos in soil. The following notes provide additional detail on the numbered boxes in the flowchart.

Detailed Description of the Figure 2 Flowchart

Box **Description**

1. The process may initiated in many ways, including (but not limited to):
   a) Fortuitous observations on undeveloped parcels,
   b) Due diligence assessment at a Brownfields redevelopment,
   c) Discovery of co-located asbestos contamination at an existing 21e site.

2. The MCP would be revised to include a specific 2-hour notification trigger (at 310 CMR 40.0321). 2-hour notification would be required for friable material (including soil) containing asbestos equal to or greater than 1%. Similar to the existing Imminent Hazard criteria listed at 40.0321, the asbestos trigger would be tied to specific locations and receptor populations.

   The existing 2-hour notification for exceedance of a Reportable Quantity of asbestos (1 pound over a 24-hour period) is retained. Also, the general provisions for 2-hour notification of Imminent Hazards (not specific to asbestos) would also apply.

   See Box 10.

3. The MCP would be revised to include specific 120-day notification triggers, including Reportable Concentrations in Soil (1%). Language would also be inserted at 310 CMR 40.0315 to require 120-day notification of Debris containing asbestos at concentrations equal to or greater than 1% (NOTE: RCs don't apply to debris.) The 120-notifications would apply to friable Debris located anywhere (except where covered by the 2-hr notification) and non-friable Debris located in "sensitive areas".

   As with any 120 notification, there would be an opportunity for an LRA. See Box 5.

4. Material, including soil, containing less than 1% asbestos, and non-friable Debris containing greater than 1% asbestos, but located outside "sensitive areas", would not trigger notification under the MCP unless site-specific conditions would create an Imminent Hazard (310 CMR 40.0321), a requirement that is not specific to asbestos. If such site poses a Significant Risk, cleanup would still be required pursuant to 310 CMR 40.0370, outside of the MCP process.

   Note that any disturbance of soil/debris containing asbestos may still be subject to notice to BWP.

   Note also that 21E notification could be required at a later date if site conditions (site use, friability of material, depth to material) were to change.

5. As with any hazardous material, there is an opportunity to address small (less than 20 yd^3) releases prior to the 120-day notification by conducting a Limited Removal Action.

6 Since an asbestos Limited Removal Action would involve the excavation and management of asbestos containing material or asbestos containing waste material, notification of the BWP asbestos program is required pursuant to BWP regulation.

7. The LRA would be conducted using BWP Best Management Practices (BMPs) using licensed asbestos contractors and following the MCP requirements at 310 CMR 40.0318.

8. If the LRA successfully eliminates the site conditions that trigger a 120-day notification, then the 21E notification is not required, and a 21E Release Tracking Number (RTN) is not issued.

9. 120-day notification to DEP/BWSC is required if an LRA is not applicable, or if the LRA wasn't able to completely remove the material. The release is assigned a Release Tracking Number and an LSP is required to oversee work at the site.

10. DEP/BWSC must be notified of the release within 2 hours of obtaining knowledge of the condition. A Release Tracking Number (RTN) would be issued at this time and an LSP retained to oversee an Immediate Response Action at the site.

    BWSC and BWP must coordinate DEP emergency response activities following 2-hour notifications to ensure that the regulatory requirements of both programs are addressed.

11. The MCP requires that the nature and extent of the release be adequately defined. While the level of effort necessary to adequately characterize the release varies site-by-site, an adequate characterization is necessary to characterize the risk posed by the site contamination and conduct response actions.

12. The MCP has incentives and requirements to conduct Preliminary Response Actions (such as IRAs, RAM and URAMs) to reduce risks at a site. Immediate Response Actions (IRAs) are required following a 2-hour notification. Preliminary measures may, in fact, be sufficient to permanently cleanup the site.

13. Since an asbestos Preliminary Response Action would involve the excavation and management of asbestos containing material or asbestos containing waste material, notification of the BWP asbestos program is required pursuant to BWP regulation.

14. Some PRAs, such as Immediate Response Actions, require explicit DEP/BWSC approval while others, such as RAMs, may be explicitly approved, presumptively approved or not need DEP approval, depending upon specific circumstances (and depending on proposed disinvestments).

15. Asbestos PRAs would be conducted pursuant to DEP/BWP-published Best Management Practices (BMPs) and using licensed asbestos contractors. Licensed Site Professionals (LSPs) are required to oversee PRAs under the MCP, sometimes with DEP approvals as well (see #14).

16. Sometime in the distant future DEP/BWSC may publish Method 1 cleanup standards for asbestos fibers in soil. Such standards would likely not apply to chunks of asbestos, or non-friable asbestos. In the absence of an MCP Method 1 standard, a Method 3 Risk Characterization would be required. (see box #17)

17. In order to achieve a Permanent Solution, a site must be shown to pose "No Significant Risk" of harm to health, safety, public welfare and the environment. DEP has outlined several approaches for making such a demonstration for asbestos in soil (see Table 2 and Figure 3). DEP has proposed that MCP Upper Concentration Limits ("UCLs") not be applied to asbestos, because there may be site conditions that warrant leaving behind high levels of asbestos (e.g., asbestos-coated pipes left *in situ* with institutional controls). However, DEP is also proposing to define asbestos >1% in accessible soil to be "a source to ambient air", triggering an RAO requirement (40.1003) to eliminate sources. If the risk characterization concludes that the site poses a risk, then further remediation is required to achieve a "Permanent Solution".

18. Since an asbestos Comprehensive Response Action may involve the excavation and management of asbestos containing material or asbestos containing waste material, notification of the BWP asbestos program is required pursuant to BWP regulation.

19. Asbestos Comprehensive Response Actions would be conducted pursuant to DEP/BWP-published Best Management Practices (BMPs) and using licensed asbestos contractors. Licensed Site Professionals (LSPs) are required to oversee such remediation under the MCP, sometimes with DEP/BWSC approvals as well (Tier IA sites, subject to disinvestment).

20. If the site is shown to pose No Significant Risk for all unrestricted sites uses, including residential use and construction/excavation scenarios, then no Activity and Use Limitation (AUL) is required. Additional RAO requirements include the elimination of continuing sources of asbestos to the environment, which DEP would define to include the presence of 1% friable and non-friable asbestos material in accessible soil .

21. If the finding of No Significant Risk is predicated on some limitation on the future use of the site (such as industrial use, a cap, or “no excavation”), then the Response Action Outcome must include an Activity and Use Limitation.

Appendix C

Proposed Draft Regulations

Notification and Cleanup of Asbestos

NOTE TO REVIEWERS: *The following changes are proposed to clarify the notification and cleanup requirements for asbestos fibers in soil and asbestos in Debris.*

Issue: When asbestos concentration is expressed as a percent, MADEP is proposing not to specify whether it is %-weight or %-area for notification purposes, so that either result would trigger notification.

Issue: The terms "friable" and "nonfriable" are used to, in part, determine notification requirements. Should the MCP define these terms in 310 CMR 40.0006, rely upon existing state and/or federal definitions, or define new descriptive terms to distinguish between material that has (or may) release asbestos fibers and material that is unlikely to release such fibers?

The notification triggers include:

- *2-hour notification requirement for asbestos in surficial soil near residences, schools, playgrounds and parks (40.0321);*
- *120-day notification requirements (Reportable Concentrations) for asbestos fibers in soil (40.1600); and*
- *120-day notification requirement for asbestos in Debris (40.0315).*

The sections related to cleanup requirements include:

- *Detailing that asbestos does <u>not</u> have an Upper Concentration Limit in Soil or Groundwater (40.0996); and*
- *Defining asbestos or Debris containing asbestos at concentrations greater than 1% in surficial soil to be a source to ambient air (40.1003).*

40.1600: Massachusetts Oil and Hazardous Material List
Table 1 Alphabetical Order

Chemical Name	CAS NUM.	DEP RQ (Pounds)	NAME SOURCES	Reportable Concentrations GW1 (mg/l)	GW2 (mg/l)	S1 (mg/kg)	S2 (mg/kg)
AMOSITE	01332-21-4	1	1,3,5,6,8	**NA**	**NA**	**1%**	**1%**
ANTHOPHYLLITE	01332-21-4	1	1,3,5,6,8	**NA**	**NA**	**1%**	**1%**
ASBESTOS	01332-21-4	1	1,3,5,6,8	**NA**	**NA**	**1%**	**1%**
TREMOLITE	01332-21-4	1	1,3,5,6,8	**NA**	**NA**	**1%**	**1%**

40.1600: Massachusetts Oil and Hazardous Material List
Table 2 CAS NUMBER ORDER

CAS NUM.	Chemical Name	DEP RQ (Pounds)	NAME SOURCES	Reportable Concentrations GW1 (mg/l)	GW2 (mg/l)	S1 (mg/kg)	S2 (mg/kg)
01332-21-4	AMOSITE ANTHOPHYLLITE ASBESTOS TREMOLITE	1	1,3,5,6,8	**NA**	**NA**	**1%**	**1%**

40.0315: Releases Which Require Notification Within 120 Days

(5) a release to the environment indicated by the measurement of :

a) friable Debris containing asbestos at a concentration equal to or greater than 1 percent, at the ground surface or mixed in subsurface soil, except where a 2-hour notification is required pursuant to 310 CMR 40.0321; or

b) non-friable Debris containing asbestos at a concentration equal to or greater 1 percent, at the ground surface or within a depth of twelve inches below the ground surface, at any location within 500 feet of a residential dwelling, school, playground, recreation area or park, unless access by children is controlled or prevented by means of bituminous pavement, concrete or other physical barrier.

40.0321: Reporting Releases and Threats of Release that Pose or Could Pose an Imminent Hazard

…

(2) For the purpose of fulfilling the "Two Hour" release notification obligations of 310 CMR 40.0311(7), the following releases could pose an Imminent Hazard to human health:

(a)…

(b)…

(c) a release to the environment indicated by the measurement of asbestos in soil at a concentration equal to or greater than 1 percent, or friable Debris containing asbestos at a concentration equal to or greater than 1 percent, at the ground surface or within a depth of twelve inches below the ground surface, at any location within 500 feet of a residential dwelling, school, playground, recreation area or park, unless access by children is controlled or prevented by means of bituminous pavement, concrete, or other physical barrier.

(~~c~~d) a release to the environment for which estimated long-term risk levels associated with current exposures are greater than ten times the Cumulative Receptor Risk Limits in 310 CMR 40.0993(6). Past exposures may be included in such evaluations to the extent that it is reasonable to quantify those exposures.

40.0996: Method 3 Upper Concentration Limits

…

(8) Except as specified in 310 CMR 40.0996(8)(c), f~~F~~or any oil or hazardous material not listed at 310 CMR 40.0996(7), either a default or chemical-specific Upper Concentration Limit must be used.

(a) The default Upper Concentration Limit in Groundwater shall be 10,000 µg/L and the default Upper Concentration Limit in Soil shall be 1,000 µg/g.

(b) The chemical-specific Upper Concentration Limits shall be calculated using the methodology presented at 310 CMR 40.0983 and 310 CMR 40.0984.

1. The Upper Concentration Limit in Groundwater shall be equal to ten times the highest groundwater standard calculated at 310 CMR 40.0983 or 100,000 µg/L, whichever is lower.
2. The Upper Concentration Limit in Soil shall be equal to ten times the highest soil standard calculated at 310 CMR 40.0984, or 10,000 µg/g, whichever is lower.

(c) For the following oil and/or hazardous material, the Upper Concentration Limits in Soil and Groundwater are not applicable. As a result, the comparison of site concentrations to Upper Concentration Limits pursuant to 310 CMR 40.0996(3) is not required, and the need for an Activity and use Limitation shall not be determined by comparison to an Upper Concentration Limit in Soil, as described in 310 CMR 40.1012(2)(a)3. and 310 CMR 40.1012(3)(b).

1. asbestos

40.1003: General Provisions for Response Action Outcomes

…

(5) A Class A or Class B Response Action Outcome shall not be achieved unless and until each source of oil and/or hazardous material which is resulting or is likely to result in an increase in concentrations of oil and/or hazardous material in an environmental medium, either as a consequence of a direct discharge or through intermedia transfer of oil and/or hazardous material, is eliminated or controlled.

(a) Such sources may include, without limitation:
1. leaking storage tanks, vessels, drums and other containers;
2. dry wells or wastewater disposal systems which are not in compliance with regulations governing discharges from those systems;
3. contaminated fill, soil, sediment and waste deposits; and
4. non-aqueous phase liquids.

(b) For the purposes of 310 CMR 40.1003(5), the following conditions are defined to be a source to ambient air:
1. asbestos in accessible soil at a concentration equal to or greater than 1 percent by weight or by area; and
2. Debris containing asbestos at a concentration equal to or greater than 1 percent by weight or by area, located on or mixed in accessible soil.

(c~~b~~) For the purposes of 310 CMR 40.1003(5), the downgradient leading edge of a plume of oil and/or hazardous material dissolved in and migrating with groundwater shall not, in and of itself, be considered a source of oil and/or hazardous material.